

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A method of deciding an Internet address of a device to be specified in a network connecting a plurality of devices that communicate with each other by using an Internet Protocol, the method comprising the steps of:

detecting and collecting addresses, including IP addresses, of all the other devices connected to the network by receiving and analyzing signals flowing through the network; and

selecting an IP address, which is different from the collected addresses, from among a group of applicable IP addresses.

2. (original): The method according to claim 1, further comprising the steps of:

checking whether the selected IP address matches with the IP address of any of said other devices; and

if the selected IP address matches with the IP address of any of said other devices, repeating the step of selection of the IP address until the selected IP address does not match with the IP address of any of said other devices.

3. (currently amended): A method of deciding an Internet address of an added device to be specified in a network connecting a plurality of devices that communicate with each another by using an Internet Protocol, the method comprising the steps of:

detecting addresses, including IP addresses and MAC addresses, of all the other devices connected to the network by receiving and analyzing signals flowing through the network;

selecting an IP address and a MAC address among the detected addresses to so that said added device can act pose as a posed device having the IP address and the MAC address;

sending a destination signal on the network by using the address of the posed device, and collecting addresses of other devices by acquiring responses to the destination signal; and

selecting an IP address, which is different from the collected addresses, among a group of applicable IP addresses.

4. (original): The method according to claim 3, which comprises collecting complete address information by selecting an IP address and a MAC address other than the IP address and the MAC address of the posed device for any device that does not respond, changing the posed device until all the devices are posed, and performing the step of sending the destination signal for each of the posed devices.

5. (original): The method according to claim 3, further comprising the steps of:
 checking whether the selected IP address matches with the IP address of any of said other devices; and

 if the selected IP address matches with the IP address of any of said other devices, repeating the step of selection of the IP address until the selected IP address does not match with the IP address of any of said other devices.

6. (currently amended): A method of selecting an IP address for an added device that does not overlap with other addresses among the an effective address range permitted as IP addresses, the method comprises the steps of:

 detecting and collecting addresses of all the other devices connected with the added device to the a network by receiving and analyzing signals flowing through the network;

 sectioning binary numerals of the collected IP address at Nth bit ($1 \leq N \leq K$, K is a predetermined natural number) from a minimum digit, and defining digits not less than the Nth bit as high rank bits and digits lower than Nth bit as low rank bits;

 judging whether all of the high rank bits of the collected IP addresses are the same;

 if all of the high rank bits are not the same, changing N to N+1, N-1, or to a desired number, and sectioning the binary numerals in the step of sectioning to make the judgment at the judgment step;

 repeating the number changing step until all of the high rank bits become the same;

if all of the high rank bits are the same, adopting a value expressed by a binary number composed of the same high rank bits and low rank bits set all to 0 as an IP network address, and adopting a value expressed by a binary number composed of high rank bits set all to 1 and low rank bits set all to 0 as subnet mask; and

selecting an IP address, which is different from the IP address of any the other device connected to the network, from among a group of effective IP addresses defined by the IP network address and the subnet mask.

7. (currently amended): A method of searching and collecting all the addresses already being used in an environment where all packets flowing through a network connected by using connecting means such as switching hub and bridge cannot be observed, by a device coupled to the network and posing as another device coupled to the network by using an address of such another device, the method comprising the steps of:

selecting an address other than an already posed address to pose as that an address of a posed device;

sending a destination signal on a network to any device having an IP address that does not respond by using the IP address of the posed device, and collecting addresses of other devices by acquiring responses to the destination signal; and

repeating the selection of the an address and sending of the a destination signal until there are no addresses that is have not been posed does not exist.

8. (currently amended): A method of limiting an address range to be searched in an environment where a wide address space is used, the method comprising the steps of:

restricting addresses in the range to be searched by using a net mask that has a suitable predetermined value; and

repeating a search of the address range with use of the net mask of smaller value if all matters to be searched are detected.

9. (currently amended): A method for automatically deciding a value of an Internet address that is not overlapped in an environment where a plurality of similar IP address deciding

devices, each having its own MAC address, are used, the method comprising at an IP address deciding device the steps of:

selecting an IP address that is intended to for use and its own MAC address;

sending an address resolution request packet using the selected IP address as that of a transmitter and as a requested address;

observing for a predetermined period of time whether or not an address resolution request packet, including the an identical IP address used as that of a transmitter and as a requested address and a MAC address different from its own MAC address, is sent;

when the address resolution request packet is not observed, then setting the IP address as its own IP address of the device to finish the operation, and when the address resolution request packet is observed, then judging whether the MAC address included in the packet is smaller than its own MAC address; and

when the MAC address is smaller than its own MAC address, then setting the IP address as its own IP address to finish the operation, and when the MAC address is not smaller than its own MAC address, then selecting another IP address that is intended to be used.

10. (currently amended): A computer readable medium for storing instructions, which when executed on a computer, causes the computer to perform a method of deciding an Internet address of a device to be specified in a network connecting a plurality of devices that communicate with each other by using an Internet Protocol, the method comprising the steps of:

detecting and collecting addresses, including IP addresses, of all the other devices connected to the network by receiving and analyzing signals flowing through the network; and

selecting an IP address, which is different from the collected addresses, from among a group of applicable IP addresses

11. (currently amended): A computer readable medium for storing instructions, which when executed on a computer, causes the computer to perform a method of deciding an Internet address of an added device to be specified in a network connecting a plurality of devices that communicate with each another by using an Internet Protocol, the method comprising the steps of:

detecting addresses, including IP addresses and MAC addresses, of all the other devices connected to the network by receiving and analyzing signals flowing through the network;

selecting an IP address and a MAC address among the detected addresses to so that said added device can act pose as a posed device having the IP address and the MAC address;

sending a destination signal on the network by using the address of the posed device, and collecting addresses of other devices by acquiring responses to the destination signal; and

selecting an IP address, which is different from the collected addresses, among a group of applicable IP addresses.

12. (currently amended): A computer readable medium for storing instructions, which when executed on a computer, causes the computer to perform a method of selecting an IP address for an added device that does not overlap with other addresses among the an effective address range permitted as IP addresses, the method comprises the steps of:

detecting and collecting addresses of all the other devices connected with the added device to the a network by receiving and analyzing signals flowing through the network;

sectioning binary numerals of the collected IP address at Nth bit ($1 \leq N \leq K$, K is a predetermined natural number) from a minimum digit, and defining digits not less than the Nth bit as high rank bits and digits lower than Nth bit as low rank bits;

judging whether all of the high rank bits of the collected IP addresses are the same;

if all of the high rank bits are not same, changing N to N+1, N-1, or to a desired number, and sectioning the binary numerals in the step of sectioning to make the judgment at the judgment step;

repeating the number changing step until all of the high rank bits become the same;

if all of the high rank bits are the same, adopting a value expressed by a binary number composed of the same high rank bits and low rank bits set all to 0 as an IP network address, and adopting a value expressed by a binary number composed of high rank bits set all to 1 and low rank bits set all to 0 as subnet mask; and

selecting an IP address, which is different from the IP address of any ~~the~~ other device connected to the network, from among a group of effective IP addresses defined by the IP network address and the subnet mask.

13. (currently amended): A computer readable medium for storing instructions, which when executed on a computer, causes the computer to perform a method of searching and collecting all ~~the~~ addresses already being used in an environment where all packets flowing through ~~a~~ network connected by using connecting means ~~such as switching hub and bridge~~ cannot be observed, by a device coupled to the network and posing as another device coupled to the network by using an address of such another device, the method comprising the steps of:

selecting an address other than an already posed address ~~to pose as an~~ that address of a posed device;

sending a destination signal on network to any device having an IP address that does not respond by using the IP address of the posed device, and collecting addresses of other devices by acquiring responses to the destination signal; and

repeating the selection of ~~the~~ an address and sending of ~~the~~ a destination signal until there are no addresses that ~~is have not posed does not exist~~.

14. (currently amended): A computer readable medium for storing instructions, which when executed on a computer, causes the computer to perform a method of limiting an address range to be searched in an environment where a wide address space is used, the method comprising the steps of:

restricting address in the range to be searched by using a net mask that has a suitable predetermined value; and

repeating search of the address range with use of the net mask of smaller value if all matters to be searched are detected.

15. (currently amended): A computer readable medium for storing instructions, which when executed on a computer, causes the computer to perform a method for automatically deciding a value of an Internet address that is not overlapped in an environment where a plurality

of similar IP address deciding devices, each having its own MAC address, are used, the method comprising at an IP address deciding device the steps of:

selecting an IP address that is intended to for use and its own MAC address;

sending an address resolution request packet using the selected IP address as that of a transmitter and as a requested address;

observing for a predetermined period of time whether or not an address resolution request packet, including the an identical IP address used as that of a transmitter and as a requested address and a MAC address different from its own MAC address, is sent;

when the address resolution request packet is not observed, then setting the IP address as its own IP address ~~of the device~~ to finish the operation, and when the address resolution request packet is observed, then judging whether the MAC address included in the packet is smaller than its own MAC address; and

when the MAC address is smaller than its own MAC address, then setting the IP address as its own IP address to finish the operation, and when the MAC address is not smaller than its own MAC address, then selecting another IP address that is intended to be used.

16. (currently amended): A device for deciding an Internet address of a device to be specified in a network connecting a plurality of devices that communicate to with each other by using an Internet Protocol, the device comprising:

detecting and collecting unit which detects and collects addresses, including IP addresses, of all the other devices connected to the network by receiving and analyzing signals flowing through the network; and

address selecting unit which selects an IP address, which is different from the collected addresses, from among a group of applicable IP addresses.

17. (original): The Internet address deciding device according to claim 16, wherein said address selecting unit checks whether the selected IP address matches with the IP address of any of said other devices, and if the selected IP address matches with the IP address of any of said other devices then repeats the selection of the IP address until the selected IP address does not match with the IP address of any of said other devices.

18. (currently amended): A computer-based apparatus operative to decide an ~~program for causing the computer to perform a method of deciding~~ Internet address of a device to be specified in a network connecting a plurality of devices that communicate with each other by using an Internet Protocol, the ~~method apparatus~~ comprising the steps of:

a collecting unit for detecting and collecting addresses, including IP addresses, of all the other devices connected to the network by receiving and analyzing signals flowing through the network; and

a selecting unit for selecting an IP address, which is different from the collected addresses, from among a group of applicable IP addresses.

19. (currently amended): A computer- based apparatus operative to decide an ~~program for causing the computer to perform a method of deciding~~ Internet address of an added device to be specified in a network connecting a plurality of devices that communicate with each other by using an Internet Protocol, the ~~method apparatus~~ comprising the steps of:

a collecting unit for detecting and collecting addresses, including IP addresses and MAC addresses, of all ~~the~~ other devices connected to the network by receiving and analyzing signals flowing through the network;

a first selecting unit for selecting an IP address and a MAC address among the detected addresses ~~to so that said added device can act~~ pose as a posed device having the IP address and the MAC address;

a sending unit for sending a destination signal on the network by using the address of the posed device, and collecting addresses of other devices by acquiring responses to the destination signal; and

a second selecting unit for selecting an IP address, which is different from the collected addresses, among a group of applicable IP addresses.

20. (currently amended): A computer-based apparatus operative to select ~~program for causing the computer to perform a method of selecting~~ an IP address for an added device that does not overlap with other addresses among the an effective address range permitted as IP addresses, the ~~method apparatus~~ comprising comprises the steps of:

a collecting unit for detecting and collecting addresses of all the other devices connected with the added device to the a network by receiving and analyzing signals flowing through the network;

a sectioning unit for sectioning binary numerals of the collected IP address at Nth bit ($1 \leq N \leq K$, K is a predetermined natural number) from a minimum digit, and defining digits not less than the Nth bit as high rank bits and digits lower than Nth bit as low rank bits;

a judging unit for judging whether all of the high rank bits of the collected IP addresses are the same;

if all of the high rank bits are not the same, a changing unit for changing N to N+1, N-1, or to a desired number, and sectioning the binary numerals in the step of sectioning to make the judgment at the judgment step;

a repeating unit for repeating the number changing step until all of the high rank bits become the same;

if all of the high rank bits are the same, an adopting unit for adopting a value expressed by a binary number composed of the same high rank bits and low rank bits set all to 0 as an IP network address, and adopting a value expressed by a binary number composed of high rank bits set all to 1 and low rank bits set all to 0 as subnet mask; and

a selecting unit for selecting an IP address, which is different from the IP address of any the other device connected to the network, from among a group of effective IP addresses defined by the IP network address and the subnet mask.

21. (currently amended): A computer-based apparatus operative to search and collect ~~program for causing the computer to perform a method of searching and collecting all the addresses already being used in an environment where all packets flowing through a network connected by using connecting means such as switching hub and bridge cannot be observed, by a device coupled to the network and posing as another device coupled to the network by using an address of such another device, the method apparatus comprising the steps of:~~

a selecting unit for selecting an address other than an already posed address to pose as that an address of a posed device;

a sending unit for sending a destination signal on a network to any device having an IP address that does not respond by using the IP address of the posed device, and collecting addresses of other devices by acquiring responses to the destination signal; and

a repeating unit for repeating the selection of the an address and sending of the a destination signal until there are no addresses that is have not posed does not exist.

22. (currently amended): A computer-based apparatus operative to limit program for causing the computer to perform a method of limiting an address range to be searched in an environment where a wide address space is used, the method apparatus comprising the steps of:

a restricting unit for restricting addresses in the range to be searched by using a net mask that has a suitable predetermined value; and

a repeating unit for repeating a search of the address range with use of the net mask of smaller value if all matters to be searched are detected.

23. (currently amended): A computer-based apparatus operative to automatically decide program for causing the computer to perform a method for automatically deciding a value of an Internet address that is not overlapped in an environment where a plurality of similar IP address deciding devices, each having its own MAC address, are used, the method apparatus comprising at an IP address deciding device the steps of:

a selecting unit for selecting an IP address that is intended to for use and its own MAC address;

a sending unit for sending an address resolution request packet using the selected IP address as that of a transmitter and as a requested address;

an observing unit for observing for a predetermined period of time whether or not an address resolution request packet, including the an identical IP address used as that of a transmitter and as a requested address and a MAC address different from its own MAC address, is sent;

when the address resolution request packet is not observed, then a setting unit for setting the IP address as its own IP address of the device to finish the operation, and when the address

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resolution request packet is observed, then a judging unit for judging whether the MAC address included in the packet is smaller than its own MAC address; and

when the MAC address is smaller than its own MAC address, then the setting unit for setting the IP address as its own IP address to finish the operation, and when the MAC address is not smaller than its own MAC address, then the second selecting unit for selecting another IP address that is intended to be used.